RESEARCH, DEVELOPMENT & TECHNOLOGY TRANSFER
QUARTERLY PROGRESS REPORT

Wisconsin Department of Transportation
DT1241 02/2011

INSTRUCTIONS:
Research project investigators and/or project managers should complete a quarterly progress report (QPR) for each calendar quarter during which the projects are active.

WisDOT research program category: ☐ Policy research ☒ Wisconsin Highway Research Program ☐ Other ☐ Pooled fund TPF#		Report period year: 2013 ☐ Quarter 1 (Jan 1 – Mar 31) ☐ Quarter 2 (Apr 1 – Jun 30) ☐ Quarter 3 (Jul 1 – Sep 30) ☒ Quarter 4 (Oct 1 – Dec 31)
Project title: Evaluation of the Foundation Movements of Transportation Structures		
Project investigator: Dante Fratta	Phone: (608) 265-5644	E-mail: fratta@wisc.edu
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WisDOT project ID: 0092-09-05	Other project ID:	Project start date: 2/5/2009
Original end date:	Current end date: 12/31/2013	Number of extensions: 2

Project schedule status:
☐ On schedule ☒ On revised schedule ☐ Ahead of schedule ☒ Behind schedule

Project budget status:

Total Project Budget	Expenditures Current Quarter	Total Expenditures	% Funds Expended	% Work Completed
$109,893.00	$9,550.00	$105,376.19	96%	92%

Project description:

- The overall research objective of this study is to produce a document summarizing simplified design procedures for evaluation of foundation movements for transportation structures within the LRFD framework. Recommendations for the measurement methods of input parameters for those design procedures will also be provided.
- This project is a legacy project that was originally funded to Prof. James Schneider

Progress this quarter (includes meetings, work plan status, contract status, significant progress, etc.):

- PhD student Max Garnier Villarreal has been working in this project and has been collecting deformation data from new bridges being built on a State Highway 51 project in Sun Prairie.
- In the last four quarters, Mr. Garnier has installed survey targets in the new NB bridges. The research team performed field recognition and has continued to install survey markers to monitor the deformation of the structures.
- Displacement measurements have been taken to evaluate the deformation of the bridge structures over the winter before the bridges were open to traffic.
- Along with the field monitoring, Mr. Garnier Villarreal Literature has continued evaluating the literature and comparing the response of transportation infrastructure supported with shallow and deep

foundation and comparing the response to those of the a new GRS-IBS bridge system built in 2012 in Bloomer, WI.
- The results from the deformation of the new bridges in Highway 51 and the GRS-IBS bridge system in Bloomer, WI are being compared to assess how bridges with very different foundation systems are behaving. These results are being incorporated to a finite element model to better understand the responses and deformation of bridges.
- A manuscript was completed and accepted to the GeoInstute Congress to be held in Atlanta, GA during the month of February.

Anticipated work next quarter:

- Monitoring of the bridges will be continued to gather a larger database of their responses.
- As the new SB bridges are being finished, survey markers will be installed on these structures to start monitoring their deformation.
- If needed, new reference points and benchmarks will be installed to perform the monitoring of the new bridges.
- Results will be analyzed in ANSYS, a finite element model.

Circumstances affecting project or budget:

- The NB road was open to traffic this summer to allow construction of the SB bridges. We are installing surveying points on the new structures on the SB/EB lane bridges while we are collecting data for deformation on the NB bridge structures.
- The total station was accidentally dropped at the testing site and required to be sent for repair and calibration.
- The data monitoring will be longer than the period allocated to the project so we can have at least not winter season on all the bridges. We requested a no-cost extension.

Attach / insert Gantt chart and other project documentation

FOR WISDOT USE ONLY

Staff receiving QPR: K. Dinkins	Date received: 02/04/2014
Staff approving QPR:	Date approved: